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student a simple treatment of the whole subject of commercial geography. About three-fourths of the book are given to the British Empire; and the concluding chapter presents the most salient features of our own commercial geography, very concisely expressed, to be sure, as only 12 pp. are given to the United States.

A. Hartleben's Kleines Statistisches Taschenbuch über alle Länder der Erde. (Zwölfter Jahrgang.) Nach den neuesten Angaben bearbeitet von Professor Dr. Friedrich Umlauf. Wien und Leipzig, 1905.

The twelfth year of publication of this small but authoritative compilation of the statistics of all countries. The four pages on the United States, for example, give the form of government, the number of States and Territories, the name of the President, the area, population, nationalities, religions, national finances, number of vessels in the merchant marine, trade statistics, length of railroads and telegraph lines, number of post offices, the weights, measures, and money, statistics of army and navy, a list of cities and their population, and the area and population of the States, Territories, and Colonies.

Hartleben's Statistische Tabelle über alle Staaten der Erde for 1905 gives the same information on a large sheet.

Report upon the Basin of the Upper Nile; with Proposals for the Improvement of that River. By Sir William Garstin, Under Secretary of State for Public Works in Egypt. To which is attached a report upon Lake Tsana, and the rivers of the Eastern Soudan, by Mr. G. Dupuis. With Maps and Appendices. National Printing Department, Cairo, 1904.

The Nile in 1904. By Sir William Willcocks. National Printing Department, Cairo, 1904. Spon & Chamberlain, 123 Liberty St., New York. (Price, 9s.)

Geographers will be especially pleased to add these two volumes to their sources of information. No writer on any of the natural phases of the Nile basin, or on the efforts to develop its resources, can afford to neglect them. They give the results of all the latest explorations and studies in a field where there was, and still is, much to learn; a considerable amount of the data usually employed in describing the Nile basin, and the régime of its waters, will have to be revised in the light of the information now supplied.

Sir William Garstin's *Report* is one of the finest specimens of book-making yet produced by the Egyptian Ministry of Public Works. It is a handsome folio of 290 pages printed in large type, and with numerous maps, plans, and photographic reproductions. Sir William describes his recent visit to the Equatorial Lakes, summarizes the result of five years' consecutive observations on the Bahr-el-Gebel (the Nile from Albert Nyanza to the Bahr-el-Ghazal), and incidentally coördinates with his own narrative geographical information supplied by earlier observers. The result is a readable book, in spite of its technical character.

There are as yet no means of ascertaining the altitudes along the river from Victoria Lake to Khartum, as barometric and hypsometric determinations afford the only data for the relief of the country, and the results are therefore only approximate. Within two or three years, however, spirit-levelling will probably be carried up the White Nile and the Bahr-el-Gebel.

There has been considerable discussion as to whether the region of the Victoria

Nyanza was in process of desiccation, it having been asserted that a steady fall in the levels has occurred during the last 20 or 30 years. There is no doubt that a lowering of the surface has been in progress for the past 7 years; but Sir William Garstin says that during this period the rainfall was much below the average, and, in 1899, failed almost completely in the northern part of the lake. If there were a permanent fall in the Victoria Nyanza it could only be accounted for either by a general reduction in the annual rainfall or by the lowering of the bar at the Ripon Falls, the outlet of the lake. A careful examination of the Falls shows no sign of any degradation of the rock ridge, which will, of course, be lowered in time; but the process will be extremely slow. It is probable, therefore, that the fall in level is not a permanent one, but that when heavy rains set in again the lake will rise to its former level. This view is confirmed by later information, recorded in a footnote, reporting heavy rains, the rising of the waters and the disappearance under the flood of the land gained in the past few years. The maximum oscillation of the lake is from 1 to 3 feet.

It is impossible in this brief review to give any summary of the author's detailed description of the Equatorial head streams and lake sources of the Nile, or of the wide areas in which they are placed. He makes one statement, however, that will startle many writers who have repeatedly affirmed that the Equatorial Lakes supply the larger part of the water that reaches Egypt:

It may be stated, with confidence, that the White Nile contributes practically nothing to the flood which reaches Egypt. This is entirely derived from the Blue Nile and from the Atbara. On the other hand, the supply passing Aswan [Assuan], during the spring and early summer, is due, almost entirely, to the waters of the great lakes, brought down by the White Nile (p. 171).

With regard to the future utilization of the Nile, Sir William Garstin says that the two main objects are to increase the water supply of Egypt in the summer and to secure similar advantages for the Sudan in the same period. Both these ends are of equal importance, though an ample water supply for Egypt is likely to bring in an earlier return for the expenditure. He thinks the best way to secure these results would be

to reserve the waters of the Blue Nile for the improvement of the countries bordering that river, while Egypt, and the area of the Nile Valley lying to the north of Khartum, shall derive their summer supply from the sister river (p. 172).

He describes the schemes for the regulation of the two great lakes that feed the White Nile and for the prevention of the waste of water, through evaporation, caused by the vast swamps through which the river passes in the upper part of its course. He gives the grounds upon which he concludes that the regulation of the Victoria and Albert Lakes will present no insuperable difficulties; as to the improvement of the channel of the Bahr-el-Gebel so as to prevent the great wastage of water in the marshes, his proposal is to construct an entirely new channel for the Bahr-el-Gebel, which would not be much larger than one of the great canals of Egypt, and would probably have a north and south alignment from Bor to the Sobat confluence, a distance of 340 kilometers. The object would be to preserve the regulating power of the marshes for the flood water and, at the same time, to prevent the present wastage in the river during the dry season.

Sir William Willcocks' book, "The Nile in 1904," is a volume of 225 pages, 21 plates and maps, and a large number of tables, the whole comprising a summary of our present knowledge of the waters in the Nile Basin, the present state of irrigation, and the improvements needed to render it perennial. The book embraces, either in summary or detail, the large additions to information that the studies of the past few years have yielded. It supplements the great book of Lombardini, published

over forty years ago, and brings knowledge down to the present time. Sir William Willcocks says the mystery of the Nile is still far from being solved, but that enormous steps in advance have been made by the publication of Sir William Garstin's Report above noticed; and, it may be added, by this volume, which has closely followed it from the press.

The book first describes the courses, slopes, velocities, catchment basins, and discharges of the Nile and its tributaries, and treats of the climate and geology of the Nile Valley. In the second chapter the tributaries of the river and the various reaches of the Nile itself are discussed. Chapter III is devoted to the utilization of the Nile, the river in flood and in low supply, the soils of its valley, and the different methods of irrigation and flood protection. Chapter IV deals with projects for water storage and flood control, the change from basin to perennial irrigation, and the development of the Sudan. Chapter V, written by Mr. H. J. L. Beadnell, is descriptive of the geology of Egypt, its economic projects, and the Egyptian oases in the Libyan Desert.

The appendices contain a large number of tables on the discharges of the Nile and its tributaries at various points, the low and high water levels, the canal discharges and temperature, and barometrical, precipitation, and other tables for different parts of the Nile Basin.

Both writers agree that the Blue Nile and the Atbara contribute to Egypt not only most of the fertility but also most of the water. Sir William Willcocks says:

If we take 3,000 cubic metres per second as the average annual flow past Assuan we may say that the White Nile supplies 24 per cent. from more than half the area of the whole basin; the Blue Nile, 65 per cent. from one-tenth the area, and the Atbara 11 per cent. from one-twelfth of the area. The Gazelle River drains about one-sixth of the total area and adds practically nothing to the discharge.

The mean discharges for 1902 of the White Nile, Blue Nile and Atbara together were 3,560 cubic meters per second. Sir William discusses at length the great irrigation problems upon the solution of which depends the full utilization of the soil of Egypt.

Egypt has a total irrigable area of $6\frac{1}{4}$ millions acres. Of this area, 250,000 acres, which are to-day inundated in flood and lie along the edge of the deserts, must continue to be inundated in flood for all time to prevent the sands of the desert from spreading over the Nile Valley. Their value is £5,000,000. Four million acres are perennially irrigated. They have a mean value of £55 per acre, and a total value of £220,000,000. Of the remaining 2,000,000 acres, two-thirds are irrigated only in flood, and one-third is not irrigated at all. These 2,000,000 acres have a mean value of £25 per acre and are worth £50,000,000. The land of Egypt may be considered as worth £275,000,000 to-day. If it were possible perennially to irrigate the 2,000,000 acres which are without such irrigation their value would be increased by £30 per acre, or by £60,000,000.

The problem is how to provide perennial irrigation for these 2,000,000 acres, and so add £60,000,000 to the wealth of the country. To do this Egypt requires reservoirs capable of storing 4 milliards of cubic metres of water.

Sir William Willcocks' project for providing all the water required for perennial irrigation has been outlined in the *BULLETIN* (1904, No. 4, p. 233). In brief, it is to add 6 meters to the height of the Assuan dam, which will then hold up another milliard of cubic meters of water; this improvement to be supplemented by building the projected Wady Rayan reservoir, which, in conjunction with the Assuan reservoir, will supply all the water required for perennial irrigation.

Sir William commends the construction of the railroad between the Red Sea and the Nile now in progress, and advises the building of the proposed railroad along the Nile between Dongola and Abu Hamed. These two railroads are essential to the development of the Sudan. When they are in working order, irrigation projects may be carried out for the production of Sudanese cotton and wheat for export. Not

until the railroads are built can such commodities be exported at a cost of transport that is not prohibitive.

Report on the Climate and Weather of Baltimore and Vicinity. By

Oliver L. Fassig. Maryland Weather Service. Special Publication, Vol. II., Part 1b. 4to. Baltimore, 1905. Pp. 148-309.

Part 1a of the new *Report on the Climate and Weather of Baltimore and Vicinity* was reviewed in this BULLETIN for November, 1904, pp. 707-709, and what was said regarding Part 1a of this volume is true also of Part 1b, which has now been issued. This portion completes the Report on the *Climate* of Baltimore, Part II, which is promised for June 1st, or thereabouts, will comprise the Report on the *Weather* of Baltimore, and will also contain the introduction, table of contents, and index of the whole volume.

The present part (1b) deals with humidity, precipitation, sunshine and cloudiness, winds, and electrical phenomena. It also contains, at the end, an historical account of the observations and the instrumental equipment at the Baltimore station of the Weather Bureau. The same completeness of discussion, the same abundance of illustration, numerical and graphic, and the same appreciative attention to details are noted in Part 1b as were pointed out in connection with Part 1a. It is a great satisfaction to find so laborious a piece of work as this, and one which was much needed as a pattern for other studies of like character so thoroughly done. The diagrams that particularly attracted the reviewer's attention were the selected relative humidity charts (Pl. VIII), with their emphasis on the *weather* element; the average hourly wind direction (Pl. XI), the westerly winds being in blue and the easterly in red, and the diagram showing a remarkable abrupt change in direction from westerly to easterly at about noon during all months except those of winter, the prevailing monthly directions of the wind in warm, normal and cold seasons and years (Fig. 76), and a series of plates (XIII to XVII) in which eight selected factors, expressed as departures from the normal climatic conditions at Baltimore, are presented for each season and year from 1871 to 1904.

The second volume of this Report is awaited with interest.

R. DEC. W.

International Catalogue of Scientific Literature. Second Annual

Issue. F. Meteorology, including Terrestrial Magnetism. 8vo. London, September, 1904. Pp. 296.

The second annual issue of the volume on meteorology of the International Catalogue of Scientific Literature contains the titles for 1902, as well as some for 1901, which were omitted from the first issue. It is a satisfaction to note that the singular omission of all titles in the *Meteorologische Zeitschrift*—the most important meteorological journal in the world—which characterized the first volume of Meteorology, has been made good, the present issue containing the omitted 1901 titles, as well as those for 1902. The same thing is true of the *Sitzungsberichte* and the *Denkschriften* of the Vienna Academy of Sciences. But there are omissions in the case of papers published in the *Monthly Weather Review*. We note with pleasure the indexing under more than one subject-heading of papers which deal with matters which can be classified under different headings. Altogether the second issue is a considerable improvement over the first, and we do not doubt that the improvement will continue in future years.

R. DEC. W.